8-12 CHAIN LINK FENCE AND WIRE FENCE

8-12.1 Description

This Work consists of furnishing and constructing chain link fence and wire fence of the types specified in accordance with the Plans, these Specifications, and the Standard Plans at the locations shown in the Plans and in conformity with the lines as staked.

Chain link fence shall be of diamond woven wire mesh mounted on steel posts.

Wire fence shall be of barbed wire or barbed wire combined with wire mesh fastened to posts. Steel posts and steel braces, or wood posts and wood braces may be used, provided only 1 type shall be selected for use in any Contract.

Gates shall consist of a steel frame or frames covered with chain link or wire mesh.

8-12.2 Materials

Materials shall meet the requirements of the following sections:

Concrete	6-02
Chain Link Fence and Gates	9-16.1
Wire Fence and Gates	9-16.2

8-12.3 Construction Requirements

Clearing of the fence line will be required. Clearing shall consist of the removal and disposal of all trees, brush, logs, upturned stumps, roots of down trees, rubbish, and debris.

For chain link type fences, the clearing width shall be approximately 10-feet. For wire type fences, the clearing width shall be approximately 3-feet. Grubbing will not be required except where short and abrupt changes in the ground contour will necessitate removal of stumps in order to properly grade the fence line. All stumps within the clearing limits shall be removed or close cut.

Grading of the fence line sufficient to prevent short and abrupt breaks in the ground contour that will improve the aesthetic appearance of the top of the fencing when installed shall be required. It is expected that in the performance of this Work, machine operations will be required for chain link fencing, and handwork will be required for wire fencing except where sufficient width exists for machine work.

The fence shall be constructed close to and inside the Right of Way line unless otherwise directed by the Engineer or shown in the Plans. Deviations in alignment to miss obstacles will be permitted only when approved by the Engineer and only when such deviation will not be visible to the traveling public or adjacent property owners.

8-12.3(1) Chain Link Fence and Gates

8-12.3(1)A Posts

Posts shall be placed in a vertical position and, except where otherwise directed by the Engineer, shall be spaced at 10-foot centers. Spacing will be measured parallel to the slope of the ground.

All posts, except line posts for Type 3 fence, shall be set in concrete to the dimensions shown in the Plans. All concrete footings shall be crowned so as to shed water. Line posts on Type 3 fence shall be set in undisturbed earth either by driving or drilling, except as specified. Driving shall be accomplished in such a manner as not to damage the post. Voids around the post shall be backfilled with suitable material and thoroughly tamped.

Concrete footings shall be constructed to embed the line posts on Type 3 fence at grade depressions where the tension on the fence will tend to pull the post from the ground.

Where solid rock is encountered without an overburden of soil, line posts shall be set a minimum depth of 14-inches, and end, corner, gate, brace, and pull posts a minimum of 20-inches into the solid rock. The holes shall have a minimum width 1-inch greater than the largest dimension of the post section to be set. The posts shall be cut before installation to lengths that will give the required length of post above ground, or if the Contractor so elects, an even length of post set at a greater depth into the solid rock may be used.

After the post is set and plumbed, the hole shall be filled with grout consisting of 1 part Portland cement and 3 parts clean, well graded sand. The grout shall be thoroughly worked into the hole so as to leave no voids. The grout shall be crowned to carry water from the post.

Where solid rock is covered by an overburden of soil or loose rock, the posts shall be set to the full depth shown in the Plans unless penetration into solid rock reaches the minimum depths specified above, in which case the depth of penetration may be terminated. Concrete footings shall be constructed from the solid rock to the top of the ground. Grouting will be required on the portion of the post in solid rock.

Pullposts shall be spaced at 1,000-foot maximum intervals for Type 1, 3, and 6 fence, and at 500-foot maximum intervals for Type 4 fence.

End, gate, corner, and pull posts shall be braced to the adjacent brace post(s) in the manner shown in the Standard Plans. Changes in line amounting to 2-foot tangent offset or more between posts shall be considered as corners for all types of fence.

Steep slopes or abrupt topography may require changes in various elements of the fence. It will be the responsibility of the Contractor to provide all posts of sufficient length to accommodate the chain link fabric and ornamental tops adapted to receive the top rail.

All posts for chain link fence Types 1 and 6 shall be fitted with an approved top designed to fit securely over the post and carry the top rail. All round posts for chain link fence Types 3 and 4 shall have approved tops fastened securely to the posts. The base of the top fitting for round posts shall carry an apron around the outside of the posts.

8-12.3(1)B Top Rail

Top rails shall pass through the ornamental tops of the line posts, forming a continuous brace from end to end of each stretch of fence. Lengths of tubular top rail shall be joined by sleeve couplings. Top rails shall be securely fastened to terminal posts by pressed steel fittings or other appropriate means.

8-12.3(1)C Tension Wire

One continuous length of tension wire shall be used between pull posts. Sufficient tension shall be applied to avoid excess sag between the posts. Tension wires shall be tied or otherwise fastened to end, gate, corner, or pull posts by methods approved by the Engineer.

8-12.3(1)D Chain Link Fabric

Chain link fabric on Type 1, 3, 4, and 6 fence shall be placed on the face of the post away from the Highway, except on horizontal curves where it shall be placed on the side designated by the Engineer.

Chain link fabric on Type 1, 3, 4, and 6 fences shall be placed approximately 1-inch above the ground and on a straight grade between posts by excavating high points of ground. Filling of depressions will be permitted only upon approval of the Engineer.

The fabric shall be stretched taut and securely fastened to the posts. Fastening to end, gate, corner, and pull posts shall be with stretcher bars and fabric bands spaced at intervals of 15-inches or less or by weaving the fabric into the fastening loops of roll formed posts. Fastening to line posts shall be with tie wire, metal bands, or other approved method attached at 14-inch intervals. The top and bottom edge of the fabric shall be fastened with the wires spaced at 24-inch intervals to the top rail, or top and bottom tension wires as may be applicable.

Rolls of wire fabric shall be joined by weaving a single strand into the ends of the rolls to form a continuous mesh.

8-12.3(1)E Chain Link Gates

Chain link fabric shall be fastened to the end bars of the gate frame by stretcher bars and fabric bands and to the top and bottom bars of the gate frames by tie wires in the same manner as specified for the chain link fence fabric, or by other standard methods if approved by the Engineer.

Welded connections on gate frames where the galvanized coating has been burned shall be thoroughly cleaned by wire brushing and all traces of the welding flux and loose or cracked galvanizing removed. The clean areas shall then be painted with 2 coats of galvanizing repair paint, Formula A-9-73.

The drop bar locking device for the wire gates shall be provided with a 12-inch round by 18-inch deep footing of commercial concrete, crowned at the top and provided with a hole to receive the locking bar. The depth of the penetration of the locking bar into the footing shall be as specified by the manufacturer of the locking device.

8-12.3(2) Wire Fence and Gates

8-12.3(2)A Posts

Line posts shall be spaced at intervals not to exceed 14-feet. All intervals shall be measured center to center of posts. In general, in determining the spacing of posts, measurements will be made parallel to the slope of the existing ground, and all posts shall be placed in a vertical position except where otherwise directed by the Engineer.

Line posts may be driven in place provided the method of driving does not damage the post. Steel corner, gate, and pull posts shall be set in commercial concrete footings to the dimensions shown in the Plans and crowned at the top to shed water.

Concrete footings shall be constructed to embed the lower part of steel line posts, and wood anchors shall be placed on wood posts at grade depressions wherever the tension on the line wires will tend to pull the post from the ground. The concrete footings shall be 3-feet deep by 12-inches in diameter and crowned at the top.

Where solid rock is encountered without an overburden of soil, line posts shall be set a minimum depth of 14-inches and end, corner, gate, and pull posts a minimum depth of 20-inches into the solid rock. The hole shall have a minimum dimension 1-inch greater

than the largest dimension of the post section to be set. The posts shall be cut before installation to lengths that will give 4½-feet of post above ground, or if the Contractor so elects, 6-foot posts set 18-inches into the solid rock may be used.

After the post is set and plumbed, the hole shall be filled with grout consisting of 1 part Portland cement and 3 parts clean, well graded sand. The grout shall be thoroughly worked into the hole so as to leave no voids. The grout shall be crowned to carry water away from the post. Where posts are set in the above manner, anchor plates and concrete footings will not be required.

Where solid rock is covered by an overburden of soil or loose rock, the posts shall be set to the full depth of 2½-feet unless the penetration into solid rock reaches the minimum depths specified above, in which case the depth of penetration may be terminated. When the depth of the overburden is greater than 12-inches, anchor plates will be required on the steel line posts, and concrete footings shall be constructed from the solid rock to the top of the ground on steel end, gate, corner, and pull posts. When the depth of overburden is 12-inches or less, anchor plates and concrete footings will not be required. Grouting will be required on the portion of the post in solid rock.

Steel braces shall be anchored to soil or loose rock with a commercial concrete footing not less than 18-inches on any 1 side and set in solid rock to a minimum depth of 10-inches in the same manner as specified above for posts. The braces shall be set on the diagonal as shown in the Plans and connected to the post with an approved connection.

Wood braces shall be dapped ¼-inch into the posts and shall be fastened to each post with three 20d galvanized nails.

Wire braces shall consist of a 9-gage wire passed around the wood posts to form a double wire. The wire shall be fastened to each post with 2 staples and fastened together to form a continuous wire. The wires shall then be twisted together until the wire is in tension.

Where the new fence joins an existing fence, the 2 shall be attached in a manner satisfactory to the Engineer, end or corner posts being set as necessary.

Pull posts shall be spaced not more than 1,000-feet apart, but spacing shall be such as to use standard rolls of wire mesh with a minimum of cutting and waste.

Changes in alignment of 30-degrees or more shall be considered as corners, and corner posts shall be installed. Where it is deemed by the Engineer that a change in alignment of less than 30-degrees will materially lessen the strength of the fence, the line post at the angle shall be supported by the addition of braces or wires in a manner satisfactory to the Engineer.

8-12.3(2)B Barbed Wire and Wire Mesh

After the pull posts have been placed and securely braced, the barbed wire and mesh shall be pulled taut to the satisfaction of the Engineer, and each longitudinal wire shall be cut and securely fastened to the pull post with devices customarily used for the purpose. Wire or mesh shall not be carried past a pull post, but shall be cut and fastened to the pull post independently for the adjacent spans.

After the tensioning of the wire or mesh between 2 pull posts, all longitudinal wires shall be properly fastened at proper height to each intervening line post.

Wire mesh and barbed wire shall be placed on the face of the post which is away from the highway, except that on horizontal curves, the mesh and wires shall be fastened to the face on the outside of the curve unless otherwise directed by the Engineer.

Where unusual ground depressions occur between posts, the fence shall be guyed to the ground by means of a 9-gage galvanized wire attached to a deadman of approximately 100-pounds buried 2-feet in the ground. The guy wire shall be securely attached to each strand of barbed wire and to the top and bottom wires of the wire mesh fabric in a manner to maintain the entire fence in its normal shape. If necessary to guy the fence in solid rock, the guy wire shall be grouted in a hole 2-inches in a diameter and 10-inches deep. The operation of guying shall leave the fence snug with the ground.

8-12.3(2)C Vertical Cinch Stays

Vertical cinch stays shall be installed midway between posts on both types of fence. The wire shall be twisted in such a manner as to permit weaving into the horizontal fence wires to provide rigid spacing. All barbed wires and the top, middle, and bottom wire of the wire mesh shall be woven into the stay.

8-12.3(2)D Wire Gates

The wire mesh fabric shall be taut and securely tied to the frame and stays in accordance with recognized standard practice for wire gate construction.

Welded connections on gate frames shall be treated as specified for chain link fence gates.

The drop bar locking device for double wire gates shall be provided with a footing of commercial concrete 12-inches in diameter and 12-inches deep, crowned on top and provided with a hole to receive the locking bar. The diameter and depth of the hole in the footing shall be as specified by the manufacturer of the locking device.

8-12.4 Measurement

Chain link fence and wire fence will be measured by the linear foot of completed fence, along the ground line, exclusive of openings.

End, gate, corner, and pull posts for chain link fence will be measured per each for the posts furnished and installed complete in place.

Gates will be measured by the unit for each type of gate furnished and installed.

8-12.5 Payment

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

"Chain Link Fence Type ____", per linear foot.

Payment for clearing of fence line for "Chain Link Fence Type ____" shall be in accordance with Section 2-01.5.

"End, Gate, Corner, and Pull Post for Chain Link Fence", per each.

"Double 14 Ft. Chain Link Gate", per each.

"Double 20 Ft. Chain Link Gate", per each.

"Single 6 Ft. Chain Link Gate", per each.

"Wire Fence Type ____", per linear foot.

Payment for clearing of fence line for wire fence shall be in included in the unit Contract price per foot for "Wire Fence Type ____".

"Single Wire Gate 14 Ft. Wide", per each.

"Double Wire Gate 20 Ft. Wide", per each.